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10/520,331	01/04/2005	Eduard Ferninand Stikvoort	NL02 0622 US	5112

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EXAMINER	
SINGH, HIRDEPAL	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No.	Applicant(s)	
	10/520,331	STIKVOORT ET AL.	
	Examiner	Art Unit	
	HIRDEPAL SINGH	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2 and 6-8* is/are allowed.

6)☒ Claim(s) *1 and 3-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/23/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed on April 22, 2010. Claims 1-8 are pending and have been considered below.

Response to Arguments

2. Applicant's arguments filed on April 22, 2010 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knutson et al. (US 2003/0163822) in views of Cheung (US 6,476,685) and Chappell (US 2002/0141494) further in view of Cullum et al. (US 6,058,258).

Regarding claims 1 and 3:

Knutson et al discloses tuning arrangement for receiving a plurality of signal channels (paragraph 0016) and for tuning to a specific of said plurality of signal channels, the arrangement comprising:

a polyphase mixer (134 in figure 3; 174 in figure 5) for mixing said specific signal channel to an intermediate frequency which is lower than twice the bandwidth of the channel;

a polyphase IF filter (178 in figure 5) for rejecting the negative frequencies in the mixer output signal.

Knutson et al discloses all of the subject matter as described above except for specifically teaching; (1) mixer is mixing said specific signal channel to an intermediate frequency which is lower than twice the bandwidth of the channel; and (2) a polyphase group delay equalizer connected to the output of the polyphase IF filter characterized in that the transfer function of the group delay equalizer has, for the frequency range of interest, only one or more pole-zero pairs alongside of the positive imaginary axis of the complex frequency plane with the pole(s) and the zero(s) of said one or more pairs lying substantially symmetrically with respect to said positive imaginary axis, and (3) one or more pole zero pairs alongside of only the positive imaginary axis are shifted along the positive imaginary axis off of the real axis of the complex frequency plane.

However, regarding item (1) above, Chappell in same field of endeavor discloses a system and method for determining frequency response in cable TV systems where mixer is mixing said specific signal channel to an intermediate frequency which is lower than the bandwidth of the channel (paragraph 0045; figure 3).

Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to use a tuning arrangement for selecting a specific channel by mixing the local oscillator frequency to the signal channel where the oscillator frequency is lower

than twice the channel bandwidth in order to make the baseband signal frequency less than of equal to the center frequency of the preceding filter circuitry to make the response of the system desirable by getting the signal frequency lying between the cutoff frequencies of the filter circuits.

Regarding item (2) above, Cheung in same field of endeavor discloses using a group delay equalizer (abstract) and the transfer function of the equalizer has, for the frequency range of interest, only one or more pole-zero pairs alongside of the positive imaginary axis of the complex frequency plane (figure 4a) with the pole(s) and the zero(s) of said one or more pairs lying substantially symmetrically with respect to said positive imaginary axis (figure 4b).

Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to implement a group delay equalizer as taught by Cheung in the channel selection or tuning system of Knutson in order to keep the delay at a lower and invariable amount as the transfer function with poles and zeros symmetrical to the positive imaginary axis has the advantage that this arrangement compensates for the delay introduced by the filtering components as they introduce more delay at low frequencies than at high frequencies, the delay equalizer compensate for that by having more delay to high frequencies than lower frequencies.

Regarding item (3) above, Cullum in same field of endeavor discloses system and method for analyzing stability of system models where one or more pole zero pairs alongside of only the positive imaginary axis are shifted along the positive imaginary axis off of the real axis of the complex frequency plane (column 10, lines 27-35).

Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to implement teachings of Cullum in the channel selection or tuning system of Hajimiri in order to analyze the characteristics and behavior of the system and have the required implementation with the analyzation for improved performance of the system components and the overall system.

5. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hajimiri et al. (US 2002/0173337) in views of Cheung (US 6,476,685) and Chappell (US 2002/0141494) and Cullum et al. (US 6,058,258) further in view of Mathe (US 6,944,219).

Regarding claims 1 and 3:

Hajimiri discloses tuning arrangement for receiving a plurality of signal channels and for tuning (paragraph 0066) to a specific of said plurality of signal channels, the arrangement comprising:

a polyphase mixer (432 in figure 8; paragraph 0070) for mixing said specific signal channel to an intermediate frequency (paragraphs 0016 and 0073) which is lower than twice the bandwidth of the channel;

a polyphase IF filter (460 in figure 8) for rejecting the negative frequencies in the mixer output signal (paragraphs 0009, 0011 and 0073).

Hajimiri discloses all of the subject matter as described above except for specifically teaching; (1) an intermediate frequency which is lower than twice the bandwidth of the channel; and (2) a polyphase group delay equalizer connected to the

output of the polyphase IF filter where the transfer function of the group delay equalizer has, for the frequency range of interest, one or more pole-zero pairs alongside of only the positive imaginary axis of the complex frequency plane with the pole(s) and the zero(s) of said one or more pairs lying substantially symmetrically with respect to said positive imaginary axis, and (3) one or more pole zero pairs alongside of only the positive imaginary axis are shifted along the positive imaginary axis off of the real axis of the complex frequency plane.

However, regarding item (1) above, Chappell in same field of endeavor discloses a system and method for determining frequency response in cable TV systems where mixer is mixing said specific signal channel to an intermediate frequency which is lower than twice the bandwidth of the channel (paragraph 0045; figure 3).

Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to use a tuning arrangement for selecting a specific channel by mixing the local oscillator frequency to the signal channel where the oscillator frequency is lower than twice the channel bandwidth in order to make the baseband signal frequency less than of equal to the center frequency of the preceding filter circuitry to make the response of the system desirable by getting the signal frequency lying between the cutoff frequencies of the filter circuits.

Regarding item (2) above, Cheung in same field of endeavor discloses using a group delay equalizer (abstract) or a cascade of equalizers with the transfer function of the equalizer has, for the frequency range of interest, one or more pole-zero pairs alongside of the positive imaginary axis of the complex frequency plane (figure 4a) with

the pole(s) and the zero(s) of said one or more pairs lying substantially symmetrically with respect to said positive imaginary axis (figure 4b), and Mathe discloses a system where poles and Zeros are lying along positive imaginary axis only (figure 5).

Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to implement a group delay equalizer as taught by Cheung in the channel selection or tuning system of Hajimiri in order to keep the delay at a lower and invariable amount as the transfer function with poles and zeros symmetrical to the positive imaginary axis as taught by Mathe has the advantage that this arrangement compensates for the delay introduced by the filtering components as they introduce more delay at low frequencies than at high frequencies, the delay equalizer compensate for that by having more delay to high frequencies than lower frequencies.

Regarding item (3) above, Cullum in same field of endeavor discloses system and method for analyzing stability of system models where one or more pole zero pairs alongside of only the positive imaginary axis are shifted along the positive imaginary axis off of the real axis of the complex frequency plane (column 10, lines 27-35).

Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to implement teachings of Cullum in the channel selection or tuning system of Hajimiri in order to analyze the characteristics and behavior of the system and have the required implementation with the analyzation for improved performance of the system components and the overall system.

Regarding claims 4 and 5:

Hajimiri discloses all of the subject matter as described above except for specifically teaching that individual group delay equalizers within the cascade of group delay equalizers comprise different or same pole-zero patterns.

However, Cheung in same field of endeavor discloses using a group delay equalizer (abstract) and further discloses cascade of group delay equalizers (column 3, lines 15-20) where the pole-zero pattern of the group delay equalizers is as shown in figures 4a and figure 4b depending on the first or second order equalizer used.

Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to implement a group delay equalizer as taught by Cheung in the channel selection or tuning system of Hajimiri by cascading first or second order equalizers and to one of ordinary skill it is obvious that when using two equalizer whether they are first order or second order group delay equalizers with similar components having similar characteristics the pole-zero pattern of cascaded equalizer is obtainable as desired i.e. same or different for the cascaded equalizers in order to take advantage of different delay response of cascaded equalizers to compensate over a required frequency spectrum.

6. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hajimiri et al. (US 2002/0173337) in view of Cheung (US 6,476,685) and Chappell (US 2002/0141494) further in view Cullum et al. (US 6,058,258).

Regarding claims 1 and 3:

Hajimiri discloses tuning arrangement for receiving a plurality of signal channels and for tuning (paragraph 0066) to a specific of said plurality of signal channels, the arrangement comprising:

a polyphase mixer (432 in figure 8; paragraph 0070) for mixing said specific signal channel to an intermediate frequency (paragraphs 0016 and 0073) which is lower than twice the bandwidth of the channel;

a polyphase IF filter (460 in figure 8) for rejecting the negative frequencies in the mixer output signal (paragraphs 0009, 0011 and 0073).

Hajimiri discloses all of the subject matter as described above except for specifically teaching; (1) an intermediate frequency which is lower than twice the bandwidth of the channel; and (2) a polyphase group delay equalizer connected to the output of the polyphase IF filter where the transfer function of the group delay equalizer has, for the frequency range of interest, one or more pole-zero pairs alongside of only the positive imaginary axis of the complex frequency plane with the pole(s) and the zero(s) of said one or more pairs lying substantially symmetrically with respect to said positive imaginary axis, and (3) one or more pole zero pairs alongside of only the positive imaginary axis are shifted along the positive imaginary axis off of the real axis of the complex frequency plane.

However, regarding item (1) above, Chappell in same field of endeavor discloses a system and method for determining frequency response in cable TV systems where mixer is mixing said specific signal channel to an intermediate frequency which is lower than twice the bandwidth of the channel (paragraph 0045; figure 3).

Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to use a tuning arrangement for selecting a specific channel by mixing the local oscillator frequency to the signal channel where the oscillator frequency is lower than twice the channel bandwidth in order to make the baseband signal frequency less than of equal to the center frequency of the preceding filter circuitry to make the response of the system desirable by getting the signal frequency lying between the cutoff frequencies of the filter circuits.

Regarding item (2) above, Cheung in same field of endeavor discloses using a group delay equalizer (abstract) or a cascade of equalizers with the transfer function of the equalizer has, for the frequency range of interest, one or more pole-zero pairs alongside of only the positive imaginary axis of the complex frequency plane (figure 4a) with the pole(s)
and the zero(s) of said one or more pairs lying substantially symmetrically with respect to said positive imaginary axis (figure 4b).

Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to implement a group delay equalizer as taught by Cheung in the channel selection or tuning system of Hajimiri in order to keep the delay at a lower and invariable amount as the transfer function with poles and zeros symmetrical to the positive imaginary axis has the advantage that this arrangement compensates for the delay introduced by the filtering components as they introduce more delay at low frequencies than at high frequencies, the delay equalizer compensate for that by having more delay to high frequencies than lower frequencies.

Regarding item (3) above, Cullum in same field of endeavor discloses system and method for analyzing stability of system models where one or more pole zero pairs alongside of only the positive imaginary axis are shifted along the positive imaginary axis off of the real axis of the complex frequency plane (column 10, lines 27-35).

Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to implement teachings of Cullum in the channel selection or tuning system of Hajimiri in order to analyze the characteristics and behavior of the system and have the required implementation with the analyzation for improved performance of the system components and the overall system.

Allowable Subject Matter

7. Claims 2 and 6-8 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record discloses a system and method for tuning signal channels with poly phase mixer to downconvert frequency to intermediate frequency as desired and further using group delay equalizer after the filter, with a transfer function of the equalizer with pole and zero in upper half of the complex plane, but prior art fails to discloses or teach that the system with group delay equalizer that has pole and zero symmetrical to positive imaginary axis or in upper half of complex plane, also has in phase and quadrature parts with balanced operational amplifiers, conductance and capacitances as claimed connected between the specified nodes for constituting the

pole and the capacitances for constituting zero and for the shifting purpose for the cascade of polyphase group delay equalizers.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Henkel (US 2003/0020551) disclose a electrical filter with blocking behavior for predetermined frequency.

b. Yang et al. (US 7,164,711) disclose a system and method for programmable receiver side equalizer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HIRDEPAL SINGH whose telephone number is (571) 270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off) 8:30AM-6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H.S/

/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611
Examiner, Art Unit 2611